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ABSTRACT

The conditions of day care quality under which infants direct secure attachment behaviors toward their day care providers were examined. Two groups of 12- to 18-month-old infants, who were experiencing either 1:4 or 1:7 caregiver-to-infant ratios, and their day care providers, were observed while they interacted in their day care centers. Caregivers' effectiveness in caring for the infants, and infants' attachment behaviors toward the day care providers, were assessed. Results showed that infants cared for in groups with more favorable ratios had more effective caregivers, and were thus more likely to direct secure attachment behaviors toward day care providers. Group size had a similar effect on infant and caregiver outcome measures, with smaller groups being associated with more effective caregiving and more secure attachment behaviors. For infants in groups with less favorable ratios, continuity of care in the same day care center was more important for the expression of secure attachment behaviors toward day care providers than was continuity of care with the same caregiver. Girls' day care providers were more effective than boys' providers, and girls, in turn, were more likely than boys to direct secure attachment behaviors toward their day care providers. (Author/SH)

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Infants' Attachment Behaviors with their Day Care Providers

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ABSTRACT

The conditions of day care quality (e.g. caregiver to infant ratios, caregiver stability, and caregiver effectiveness) under which infants direct secure attachment behaviors toward their day care providers, and the mechanism through which they come to do so were examined. Two groups of 12- to 18-month-old infants (experiencing 1:4 or 1:7 caregiver to infant ratios) and their day care providers were observed interacting in their day care centers. Caregivers' effectiveness in caring for the infants and infants' attachment behaviors toward the day care providers were assessed. Pearson correlations and simple and multiple regression analyses revealed that infants cared for in more favorable ratio groups had more effective caregivers, and were thus more likely to direct secure attachment behaviors toward these day care providers. Group size had a similar effect on infant and caregiver outcome measures, with smaller groups being associated with more effective caregiving and more secure attachment behaviors. For infants in more favorable ratio groups, stability of care was also positively linked to the occurrence of secure attachment behaviors. For infants in less favorable ratio groups, continuity of care in the same day care center was more important for the expression of secure attachment behaviors toward day care providers than was continuity of care with the same caregiver. An unexpected sex difference was also found: girls' day care providers were more effective than boys' day care providers, and girls in turn were more likely to direct secure attachment behaviors toward their day care providers than were boys.

As increasing numbers of American mothers enter the work force, the problem of finding suitable day care continues to grow in the United States. Drawing upon attachment literature which states that infants benefit from a secure attachment relationship with their primary care providers (usually the mother), researchers in the area of infant day care have investigated the possibility that infants might similarly benefit from being securely attached with the day care provider in a group care setting, given that the child in day care may spend up to 50 hours per week in the care of this adult. Our research was designed to delineate the circumstances under which secure infant-day care provider attachments might be facilitated.

RESEARCH QUESTIONS

First, we asked: Under what conditions do infants in center based care develop secure attachments with their day care providers? Three factors were expected to be important: 1.) the ratio of caregivers to infants present in the classroom; 2.) continuity of care with the same day care provider; and 3.) the effectiveness with which care was provided.

Second, we were interested in using the variables listed above to identify a model whereby secure infant-caregiver attachments are facilitated.

The following interrelationships among the principal variables were proposed:

- **caregiver to infant ratios** were predicted to exert an indirect effect on the quality of the infant-caregiver attachment relationship via the caregiver's ability to care for the infant effectively.

- **continuity of care** was predicted to exert a direct positive effect on the quality of the infant-caregiver attachment.

These hypothesized relationships are depicted graphically in Figure 1.

SUBJECTS

Thirty-two infants (20 girls) 12-18 months of age (M = 15.7 mos) participated in this study. Half of the infants (11 girls) were enrolled in day care centers maintaining 1:4 ratios; the other half (9 girls) were enrolled in centers with 1:7 ratios. Infants came from predominantly white (n=29), middle income 2-parent families. They attended day care full time (M = 42.5 hours per week), had entered non-maternal day care of any type (primarily center care) by 12 months of age (M = 3.3 mos. of age), had experienced a mean of 0.6 changes in day care arrangements, had attended the current day care center for at least 2 months (M = 9.8 mos.), and had been in the care of the current day care provider for at least 1 month (M = 4.7 mos.)

The only difference between ratio groups was the number of changes in day care arrangements (1:7 ratio group, M = 1.1 changes; 1:4 ratio group, M = 0.2 changes), which affected the length of time infants had attended the current center (1:7 ratio group, M = 8.4 mos.; 1:4 ratio group, M = 11.1 mos.).

There were no differences on any of the variables listed above for girls vs. boys in the total sample.

INSTRUMENTS

*** Caregiving Effectiveness Scale**

Derived from Ricciuti and Thomas Child-Rearing Scales. Measures caregiver sensitivity/responsiveness, warmth/affection, verbal interaction, and encouragement/facilitation of development. Scores on individual sub-scales were highly intercorrelated ($r = 0.83$ to 0.92); therefore, a composite caregiving effectiveness score was created by combining the sub-scale scores.

*** Attachment Q-Set**

A 60-item shortened version of the Waters and Deane (1985) Attachment Behavior Q-set, developed and successfully used by Howes et al. (1988), was used in the present study to assess the quality of infants' attachments with their day care providers. For some analyses, a security cutoff score of 0.33 was used to differentiate secure (0.33 and higher) from insecure (lower than 0.33) infants.

PROCEDURE

Caregiver to child ratio requirements are mandated individually by states. Thus, in order to compare caregiving effectiveness and attachment security for children in different ratio groups, infants attending day care centers in two different states were recruited for participation in this study. For each infant, a primary day care provider was identified and targeted for observations of infant-caregiver interaction. Continuity of care with this day care provider was measured as the length of time in months that the infant and caregiver had been assigned to the same classroom together.

Two independent raters each spent two non-continuous 1-hour time periods observing infants' interactions with the paired day care provider. Upon completion of the observations, one rater assessed caregiving effectiveness while a second rater assessed the quality of the infant's attachment with the day care provider.

RESULTS

Differences by Ratio Group:

Differences in caregiving effectiveness and attachment security were examined for the two ratio groups using t-tests. Compared with children being cared for in 1:7 ratio groups, children in 1:4 ratio groups had somewhat more effective caregivers ($p < .10$), and significantly higher mean attachment security scores ($p < .01$). This latter finding became even more dramatic when we used the 0.33 security cutoff score to classify children as secure vs. insecure. We found nearly twice as many secure attachments in the 1:4 ratio group (see Table 1). In terms of percentages, 69% of the infants in 1:4 ratio groups were classified as secure, compared with only 38% of the infants in 1:7 ratio groups.

Analyses of continuity of care yielded an interesting and unexpected result (see Table 2). Separate Pearson correlations for the two ratio groups revealed a moderate positive correlation between attachment security and continuity of care with the same day care provider for the 1:4 ratio group ($r = 0.36$); attachment security was unrelated to continuity of care at the same day care center ($r = 0.06$). Conversely for infants in 1:7 ratio groups, attachment security was unrelated to continuity of care with the same day care provider ($r = -0.06$), but much more strongly related to continuity of care at the same day care center ($r = 0.42$).

Differences by Group Size:

Group size may be at least as important as ratios in influencing caregiving effectiveness and attachment security. In order to examine this possibility, two groups were created: Large (fourteen or more infants) vs. Small (less than fourteen) Group Size. Differences in caregiving effectiveness and attachment security were examined for the two groups using t-tests. Compared with children being cared for in large groups, children in small groups had significantly more effective caregivers ($p < .001$) and significantly higher mean attachment scores ($p < .005$). As we can see from Table 3, the differences by Group Size are much more marked than those by Ratio Group.

Differences by Sex of Child:

T-tests of all boys vs. girls in the sample independent of ratio group membership were run as a routine procedure; no sex differences in the principal variables had been predicted *a priori*. Contrary to our expectations, however, t-tests revealed that girls had dramatically more effective caregivers than boys ($p < .005$), and had significantly higher mean attachment scores ($p < .05$). When we classified infants as secure vs. insecure (see Table 4), we found that 70% of the girls were rated as securely attached with their day care providers, compared with a mere 25% of the boys. This was true regardless of the fact that both boys and girls were equally distributed in the two ratio groups.

Paths of influence:

Simple and multiple regression equations with attachment as the dependent variable were run for the total sample in order to examine the interrelationships among the principal variables. Figure 2 lists regression coefficients and p-values for this set of analyses. We found that:

- Ratios alone predicted attachment behavior ($p < .005$), but when caregiving effectiveness was entered as a covariate, the predictive power of ratios was dramatically reduced ($p < .10$).

- Continuity of care with the same day care provider **did not** predict attachment behavior.

- Continuity of day care centers **did** predict attachment behavior ($p < .01$), and retained its predictive power when caregiving effectiveness was entered as a covariate ($p < .005$).

- Continuity of day care centers was positively related to ratios ($p < .05$).

CONCLUSIONS

- The regression analyses above suggest that caregiver to child ratios may influence the security of the infant-caregiver attachment relationship by affecting caregiving effectiveness: that is, the more favorable the ratio, the more effective the caregiving and thus the more secure the attachment.

- Caregiver to child ratios might also influence the security of the infant-caregiver attachment relationship by affecting the length of time that parents keep their children at the same center. Parents whose infants are enrolled in day care centers featuring better ratios might be more satisfied with their child care arrangements than are parents whose centers employ less favorable ratios, and may thus be more likely to keep their infants in this (more favorable) child care situation. The increased continuity of care in the same center in turn supports the growth of a secure infant-day care provider attachment relationship.

- The analyses on group size indicated that this factor may be at least as important as ratios in influencing caregiving effectiveness and attachment security. The analyses were limited, however, by the fact that fewer than 15% of the children in this study fell into the Better Ratio in Large Group and Worse Ratio in Small Group cells. The question of whether group size can mediate the effects of ratios on caregiving effectiveness and attachment security thus needs further examination. For instance, are the positive effects of being cared for in more favorable ratio groups partially dampened when that care takes place in large groups? and conversely, can the potentially negative

effects of being cared for in a less favorable ratio group be partially offset when the total group size is small? These questions can best be examined by using a 2 x 2 Ratio by Group Size design in which all cells are equally represented.

- Continuity of care with the same day care provider is important for secure attachments in smaller ratio groups, but continuity of care at the same center may become more important in larger ratio groups. Again, this is an issue which needs further investigation. For instance, is it possible that in the absence of a sensitive, effective caregiver, infants in less favorable ratio groups somehow derive a sense of felt security from familiarity with the day care setting, then transfer this sense of security to interactions with the caregiver?

- Finally, the finding of significant sex differences in the level of caregiving effectiveness received by boys vs. girls leads us to advance two possible hypotheses. The day care providers in this study may have behaved toward male vs. female infants based on stereotyped ideas about the differential needs of boys vs. girls. For instance, they may have perceived girls as more in need of reassurance and close interactions, whereas they expected more independent behavior from boys. Alternatively, since all the day care providers in this study were female, the sex differences obtained may be a result of caregivers interacting more with same-sex than with opposite-sex infants. Regardless of the reason, the finding that caregivers were more effective with female than with male infants may explain the findings of others that day care may have more deleterious effects on the socioemotional development of boys than of girls.

The corresponding differences in attachment security for boys vs. girls can probably best be explained in terms of the differential levels of caregiving effectiveness received by boys vs. girls. However, it may also be that as others have suggested, boys in general are more vulnerable to psychological stressors. If so, then the experience of being cared for in a group situation may have a greater negative impact on boys than on girls; coupled with the decreased attention from day care providers, the result may be more insecure attachments with day care providers for boys than for girls.

Figure 1. Hypothesized paths of influence through which principal variables may affect the security of infant-day care provider attachments. Caregiver-child ratios were expected to exert an indirect effect on the security of infant-caregiver attachments, via caregiving effectiveness. Continuity of care with the same day care provider was expected to exert a direct effect on the security of infant-caregiver attachments.

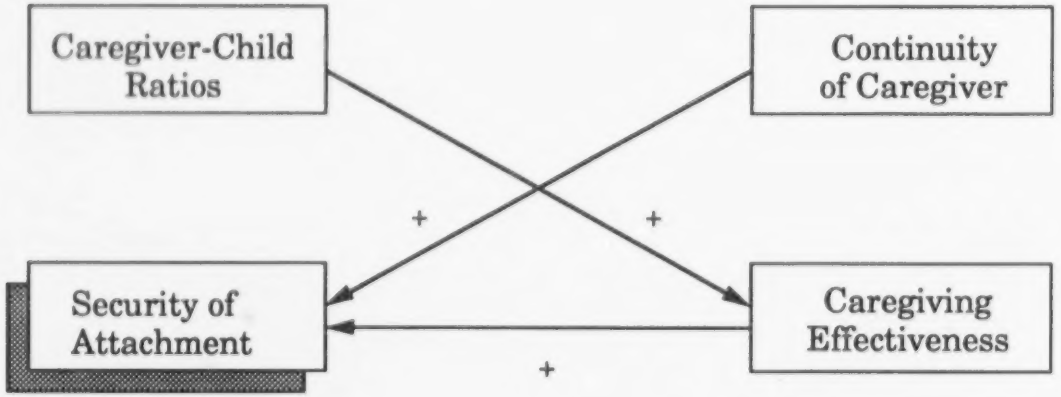
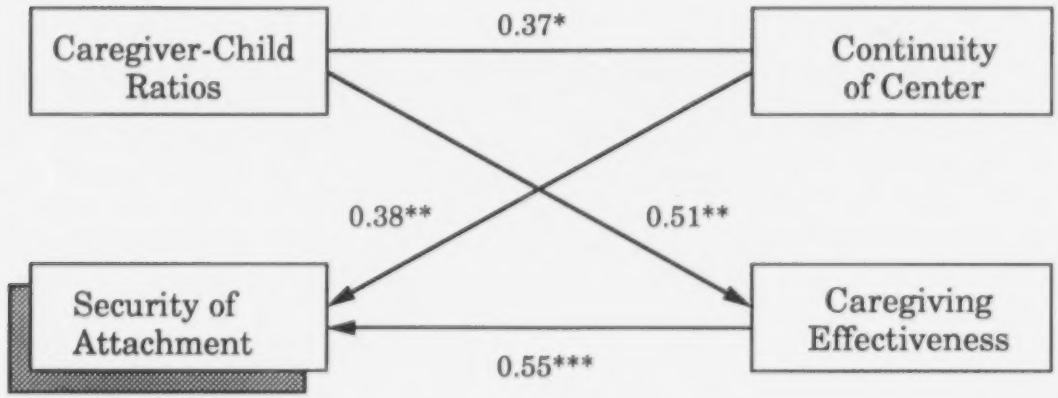


Figure 2. Paths of influence through which principal variables may affect the security of infant-day care provider attachments.



* $p < .05$
** $p < .01$
*** $p < .001$

Table 1. Proportions of securely and insecurely attached infants: More vs. Less Favorable Ratio Groups

	1 to 4 (n = 16)	**1 to 7 (n = 16)**
Secure	11 (69%)	6 (38%)
Insecure	5 (31%)	10 (62%)

Table 2. Pearson correlations of attachment security with two continuity variables for 2 Ratio Groups

	1 to 4	1 to 7
Continuity of Caregiver	0.36	-0.06
Continuity of Center	0.06	0.42

Table 3. Mean (s.d.) caregiving effectiveness and attachment security scores for infants in More vs. Less Favorable Ratio Groups and Small vs. Large Total Groups

	1 to 4	1 to 7
Caregiving Effectiveness	37.3 (17.8)	26.4 (15.6) *
Attachment Security	0.43 (.28)	0.15 (.31) **

	Small Group	Large Group
Caregiving Effectiveness	42.1 (16.6)	21.6 (10.9) ***
Attachment Security	0.45 (.20)	0.13 (.34) ***

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* $p < .10$
** $p < .05$
*** $p < .005$

Table 4. Proportions of securely and insecurely attached infants: Girls vs. Boys

	Girls (n = 20)	**Boys (n = 12)**
Secure	14 (70%)	3 (25%)
Insecure	6 (30%)	9 (75%)

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